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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,026	10/08/2003	Janet E. Hails	124-933	4943

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EXAMINER	
DOTY, HEATHER ANNE	
ART UNIT	**PAPER NUMBER**
2813	

DATE MAILED: 06/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/088,026	HAILS ET AL.
	Examiner	Art Unit
	Heather A. Doty	2813

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3/14/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless – (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-10 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Valentine et al. (EP 0 285 834 A, published 10/12/88).

Regarding claim 1, Valentine et al. teaches a method of depositing $Hg_{1-x}Cd_xTe$ onto a substrate (column 4, lines 11-14), in a MOVPE technique (MOCVD, column 2, lines 43-46), where $0 \leq x \leq 1$, comprising the step of reacting together a volatile organotellurium compound and a volatile organocadmium compound (column 2, lines 43-49) and mercury vapor (column 3, lines 54-56); characterized in that the organotellurium compound is isopropylallyltelluride (claim 4 with 3 carbon atoms) and in that the substrate is maintained at a temperature in the range of 150°C to 350°C (column 4, lines 11-14).

Regarding claims 2 and 3, Valentine et al. teaches the method of depositing $Hg_{1-x}Cd_xTe$ according to claim 1, wherein the organocadmium compound is an alkyl cadmium compound, which is dimethyl cadmium (column 2, lines 43-49).

Regarding claims 4-6, Valentine et al. teaches the method of depositing $Hg_{1-x}Cd_xTe$ according to claim 1, wherein $0 < x < 1$, $x = 0$, and $x = 1$ (column 2, lines 43-49).

Regarding claim 7, Valentine et al. teaches the method of depositing $Hg_{1-x}Cd_xTe$ according to claim 6, wherein the reaction is carried out in the presence of mercury vapor (column 3, lines 54-56).

Regarding claim 8, Valentine et al. teaches the method of depositing $Hg_{1-x}Cd_xTe$ according to claim 1, wherein the substrate comprises CdTe, GaAs, or Si.

Regarding claims 9 and 10, Valentine et al. teaches the method of depositing $Hg_{1-x}Cd_xTe$ according to claim 1, wherein the temperature of the substrate is maintained at a temperature in the range of 150°C to 300°C and 250°C to 300°C (column 4, lines 11-14).

Regarding claim 17, Valentine et al. teaches $Hg_{1-x}Cd_xTe$ obtainable by a method according to claim 1 (column 4, lines 11-14).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Valentine et al. (EP 0 285 834 A, published 10/12/88) in view of Ahlgren (U.S. 5,189,297).

Regarding claims 11-16, Valentine et al. teaches a method of fabricating an electronic device comprising the step of depositing $Hg_{1-x}Cd_xTe$ onto a substrate by a method according to claim 1 (note 35 U.S.C. 102(b) rejection above), but does not

teach connecting at least two electrodes to the $Hg_{1-x}Cd_xTe$, doping the $Hg_{1-x}Cd_xTe$, doping the $Hg_{1-x}Cd_xTe$ in such a manner than a p-n junction is formed, passivating the $Hg_{1-x}Cd_xTe$ with a layer of CdTe, a device obtainable by a method according to claim 11, or an infrared detector comprising an array of devices, each device being obtainable by a method according to claim 11.

Ahlgren teaches a method of forming contacts on a layer of $Hg_{1-x}Cd_xTe$ (column 7, lines 52-57; **92** in Fig. 5), doping $Hg_{1-x}Cd_xTe$ (layers **14** and **16** in Fig. 1; column 3, lines 39-48) in such a manner that an array of p-n junction is formed (Figs. 1 and 5), and passivating the $Hg_{1-x}Cd_xTe$ with CdTe (column 7, line 40-43).

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to combine the teachings of Valentine et al. and Ahlgren by fabricating a device according to the process steps taught by Ahlgren (connecting at least two contacts to a layer of $Hg_{1-x}Cd_xTe$, doping the $Hg_{1-x}Cd_xTe$ to form an array of p-n junctions, and passivating the $Hg_{1-x}Cd_xTe$ with a layer of CdTe), employing the method taught by Valentine et al. to deposit the layer of $Hg_{1-x}Cd_xTe$, which would result in a device obtainable by a method according to claim 11 and an infrared detector comprising an array of devices, each device being obtainable by a method according to claim 11.

The motivation for doing so at the time of the invention would have been that the method taught by Valentine et al. results in high-quality $Hg_{1-x}Cd_xTe$ epitaxial films, as expressly taught by Valentine et al. (column 2, lines 46-49), which would result in the fabrication of a high-performance device.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Valentine et al. (EP 0 285 834 A, published 10/12/88) in view of the basic organic chemistry textbook *Organic Chemistry*, Fourth Edition, written by Morrison et al.

Regarding claim 18, Valentine et al. teaches a method for the preparation of isopropylallyltelluride comprising the steps: (a) reacting a compound isopropyl lithium with Te, thereby producing isopropyl lithiumtelluride; and (b) reacting the isopropyl lithiumtelluride produced by step (a) with allyl chloride. Valentine et al. does not teach reacting the isopropyl lithiumtelluride produced by step (a) with allyl bromide.

Morrison et al. teaches in Table 1.3 (pg. 21) that allyl bromide has a weaker bond strength between carbon and bromine (165) than allyl choride has between carbon and chlorine (173).

Therefore, it would be obvious to one of ordinary skill in the art to modify the method for the preparation of isopropylallyltelluride taught by Valentine et al. by substituting allyl bromide for allyl chloride. The motivation for doing so at the time of the invention would have been that allyl bromide's weaker bond strength makes it easier to dissociate, and therefore more reactive, when reacted with isopropyl lithiumtelluride.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heather A. Doty, whose telephone number is 571-272-8429. The examiner can normally be reached on M-F, 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, Jr., can be reached at 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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